

RINGKASAN

Swadea Devi Laksitarani, 2021, Program Studi Agronomi - Program Pascasarjana, Fakultas Pertanian Universitas Jenderal Soedirman, “Pengaruh Pupuk N-P-K dan Ekstrak Sereh terhadap Karakter Pertumbuhan, Respon Fisiologi dan Hasil Padi Gogo”. Pembimbing: Ahadiyat Yugi Rahayu, S.P., M.Si., D.Tech.Sc., dan Ir. Kharisun, Ph.D.

Padi gogo merupakan salah satu ragam budidaya padi yaitu penanaman padi di lahan kering yang umumnya ditanam sekali setahun pada awal musim hujan. Namun, pengembangan pertanian pada lahan kering memiliki kendala biofisik, seperti tingkat kesuburan tanah yang rendah, sehingga diperlukan upaya pemupukan yang tepat dan seimbang dengan tujuan untuk meningkatkan ketersediaan hara bagi tanaman. Realita di lapangan menunjukkan petani belum mengetahui penggunaan dosis pupuk yang tepat dan berimbang, sehingga menyebabkan pelandaian produksi dan menurunkan efisiensi pemupukan. Ekstrak sereh memiliki senyawa metabolit sekunder yang dapat dimanfaatkan, diantaranya saponin, tanin, flavonoid, fenol, steroid, minyak atsiri dan alkaloid. Selain bermanfaat dalam perlindungan tanaman, senyawa metabolit sekunder dapat bermanfaat untuk mendukung pertumbuhan tanaman. Budidaya padi gogo dengan mengkombinasikan teknologi pemupukan dan penambahan senyawa metabolit sekunder dari ekstrak sereh berpeluang dapat meningkatkan pertumbuhan serta hasil, daya dukung lahan, serta efisiensi penggunaan pupuk sintetis.

Penelitian ini bertujuan untuk: (1) Mengetahui pengaruh pemberian dosis rendah pupuk N, P dan K terhadap karakter pertumbuhan, respon fisiologi dan hasil padi gogo. (2) Mengetahui pengaruh aplikasi konsentrasi ekstrak sereh terhadap karakter pertumbuhan, respon fisiologi dan hasil padi gogo. (3) Mengetahui pengaruh interaksi aplikasi dosis rendah pupuk N, P dan K serta konsentrasi ekstrak sereh terhadap karakter pertumbuhan, respon fisiologi dan hasil padi gogo.

Penelitian ini dilaksanakan di Desa Suro, Kecamatan Kalibagor, Kabupaten Banyumas serta Laboratorium Ekologi Tanaman Fakultas Pertanian Universitas Jenderal Soedirman Purwokerto tanggal 13 Maret 2018 sampai dengan 29 Juli 2018. Penelitian menggunakan rancangan petak terbagi (*Split plot*). Petak utama merupakan dosis pupuk N, P, dan K 100% (100 kg N ha^{-1} , $100 \text{ kg P}_2\text{O}_5 \text{ ha}^{-1}$, $50 \text{ kg K}_2\text{O ha}^{-1}$ atau $80 \text{ g N } 8\text{m}^{-2}$, $80 \text{ g P}_2\text{O}_5 8\text{m}^{-2}$, $40 \text{ g K}_2\text{O } 8\text{m}^{-2}$) dan 50% dosis rekomendasi (50 kg N ha^{-1} , $50 \text{ kg P}_2\text{O}_5 \text{ ha}^{-1}$, $25 \text{ kg K}_2\text{O ha}^{-1}$ atau $40 \text{ g N } 8\text{m}^{-2}$, $40 \text{ g P}_2\text{O}_5 8\text{m}^{-2}$, $20 \text{ g K}_2\text{O } 8\text{m}^{-2}$). Anak petak merupakan konsentrasi ekstrak sereh S0 (0%), S1 (2,5%), S2 (5%), S3 (7,5%) dan S4 (10%) dengan dosis $1200 \text{ ml petak}^{-1}$. Petak utama berjumlah 2 petak setiap ulangan dengan luas $4 \times 12 \text{ m}$. Setiap anak petak di dalamnya berukuran $2 \times 4 \text{ m}$ dengan jumlah 10 petak percobaan dan diulang sebanyak 3 kali sehingga totalnya sebanyak 30 petak percobaan. Variabel yang diamati yaitu karakter pertumbuhan meliputi: tinggi tanaman, jumlah daun, luas daun, jumlah anakan produktif, dan bobot tajuk kering; respon fisiologi yang meliputi: kandungan prolin daun padi, kadar klorofil a dan klorofil b daun padi, serta serapan hara N dan P; serta hasil meliputi: jumlah malai per rumpun, jumlah gabah per rumpun, bobot gabah per rumpun, bobot 1000 biji, bobot gabah per petak efektif, bobot gabah per hektar dan indeks panen.

Hasil penelitian menunjukkan bahwa aplikasi pupuk N, P dan K 50% dosis rekomendasi mampu meningkatkan pertumbuhan yang sama dengan dosis 100% rekomendasi pada variabel tinggi tanaman, jumlah daun, luas daun, bobot tajuk kering serta semua variabel pengamatan respon fisiologi dan hasil padi gogo. Konsentrasi 2,5% ekstrak sereh mampu meningkatkan karakter pertumbuhan yaitu jumlah anakan produktif dan bobot tajuk kering tanaman padi gogo. Kombinasi konsentrasi 2,5% ekstrak sereh dan 50% dosis rekomendasi pupuk N, P dan K dapat meningkatkan jumlah anakan produktif dan bobot tajuk kering tanaman padi gogo.

SUMMARY

SWADEA DEVI LAKSITARANI, 2021, Study of Agronomy- Postgraduate Program, Agriculture Faculty of Jenderal Soedirman University, "Effect of N-P-K Fertilizer and Lemongrass Extract On Growth, Physiological Response and Yield of Upland Rice". Supervisor: Ahadiyat Yugi Rahayu, S.P., M.Si., D.Tech.Sc., and Ir. Kharisun, Ph.D.

Upland rice is one of rice cultivation varieties, which is generally planted once a year at the beginning of the rainy season. However, agricultural development on dry land has biophysical constraints, such as low soil fertility levels, so that need an appropriate and balanced fertilization effort with the aim to oncreasing nutrient availability for plants. Reality on the field shows that farmers do not yet know the use of appropriate and balanced fertilizer doses that causing production ramp and reduce the fertilization efficiency. Lemongrass extract has secondary metabolites that can be utilized, including saponins, tannins, flavonoids, phenols, steroids, essential oils, and alkaloids. Besides being useful in plant protection, secondary metabolites coumpounds can be useful to support plant growth. Upland rice cultivation by combining fertilization technology and the addition of secondary metabolite compounds from lemongrass extract has the oppetunity to increase growth and yield, land carrying capacity, and the efficiency of using synthetic fertilizer.

Objectives of this study were (1) To determine the effect of giving low doses of N-P-K fertilizer on growth, physiological responses, and upland rice yields. (2) To determine the effect of giving lemongrass extract concretration on growth, physiological responses, and upland rice yields. (3) To determine the interaction effect of low doses N-P-K fertilizer application and lemongrass extract concretration on growth, physiological responses, and upland rice yields.

This research was carried out at Suro Village, in Kalibagor District, on Banyumas Regency and at Plant Ecology Laboratory of Agriculture Faculty Jenderal Soedirman University Purwokerto from March 13th 2018 to July 29th 2018. This research used a split plot design. The main polts were 100% N-P-K fertilizer recommendation doses (100 kg N ha⁻¹, 100 kg P₂O₅ ha⁻¹, 50 kg K₂O ha⁻¹ or 80 g N 8m⁻², 80 g P₂O₅ 8m⁻², 40 g K₂O 8m⁻²) and 50% N-P-K fertilizer recommendation doses (50 kg N ha⁻¹, 50 kg P₂O₅ ha⁻¹, 25 kg K₂O ha⁻¹ or 40 g N 8m⁻², 40 g P₂O₅ 8m⁻², 20 g K₂O 8m⁻²). Sub plots were the concentration of lemongrass extract that are S0 (0%), S1 (2.5%), S2 (5%), S3 (7.5%) and S4 (10%) with a dose of 1200 ml for every plot. The main plots consisted 2 plots per replication with 4 x 12 wide areas. Each sub plot is 2 x 4 m in size with the total of 10 experimental plots and repeated 3 times for a total of 30 experimental plots. Observed variable includes: growth character i.e plant height, number of leaves, leaf area, number of productive tillers, and dry plant crown weight; physiological response i.e content of proline, chlorophyll a and b level, and adsorption of N and P; and yield of upland rice i.e number of rice panicles, grain, and weight of grain per clump, weight of 1000 grains, weight of grain in effective plot, weight of grain per hectare and harvest index.

The result showed that application of 50% recommendation doses of N-P-K fertilizer able to increase the same growth with application of 100% recommendation doses of N-P-K fertilizer on the variables on plants height, number of leaves, leaf area, dry crown weight, and all observing variables of physiological responses and yields of upland rice. The 2.5% lemongrass extract concentration was able to increase growth, that are number of productive tillers and dry crown weight of upland rice plants. The combination of 2.5% lemongrass extract concentration and 50% recommendation doses of N-P-K fertilizer could increase the number of productive tillers and dry crown weight of upland rice plants.